Southeast Watershed Forum

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Building Partnerships for Watershed-Friendly Development

Southeast Watershed Forum

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The Southeast has lost more forests, farms and open space to sprawl than any other region

Land use changes effects water quality & water supply

Southeast Watershed Forum

approach:

Use training and strategic partnerships to build local leadership and the capacity for change in land use practices/policies.

Cumberland River Compact

approach:

Improve water quality through community-driven partnerships based on site-specific programs – become a “center” for “green development.”

Cumberland Watershed Initiative

- Chose sites in three different sub-watersheds to develop homes using watershed-friendly BMPs.

- Red River - Rural (Agricultural)
- Mill Creek – Urban (Nashville)
- Harpeth River – Suburban (53% growth)

Cumberland Watershed Initiative

- Use these pilots to prove that the bottom line of green is black! Promote them for replication
- Demonstrate that better site design practices minimize runoff and protect water quality
- Remove three impaired stream segments from the State 303d list.
- Demonstrate the power of building broad-based public-private partnerships

Paving Our Way to Water Shortages*

- Nashville has been ranked as 11th in the nation for sprawl with a 30% increase in population
- 100% increase in land use over the last 10 years
- Impervious surfaces = loss of groundwater

*NRDC report

Cumberland Watershed Initiative

- 15 objectives within four goals…
  - Create an evaluation process to measure sediment abatement
  - Implement protocols for measuring in-stream sediment flow/bank loss in each stream
  - Identify & map existing efforts & partners
  - Create an on-line toolbox for watershed protection – SWAN

    Southeast Watershed Assistance Network

Who's BOB

- Building Outside the Box Committee
  - 15-20 organizations, industries, agencies developing specific BMPs and green building techniques
- Water Quality Committee
  - 20 organizations, industries, agencies developing methods and procedures for monitoring the impact of development on each site.

Sample Partnerships

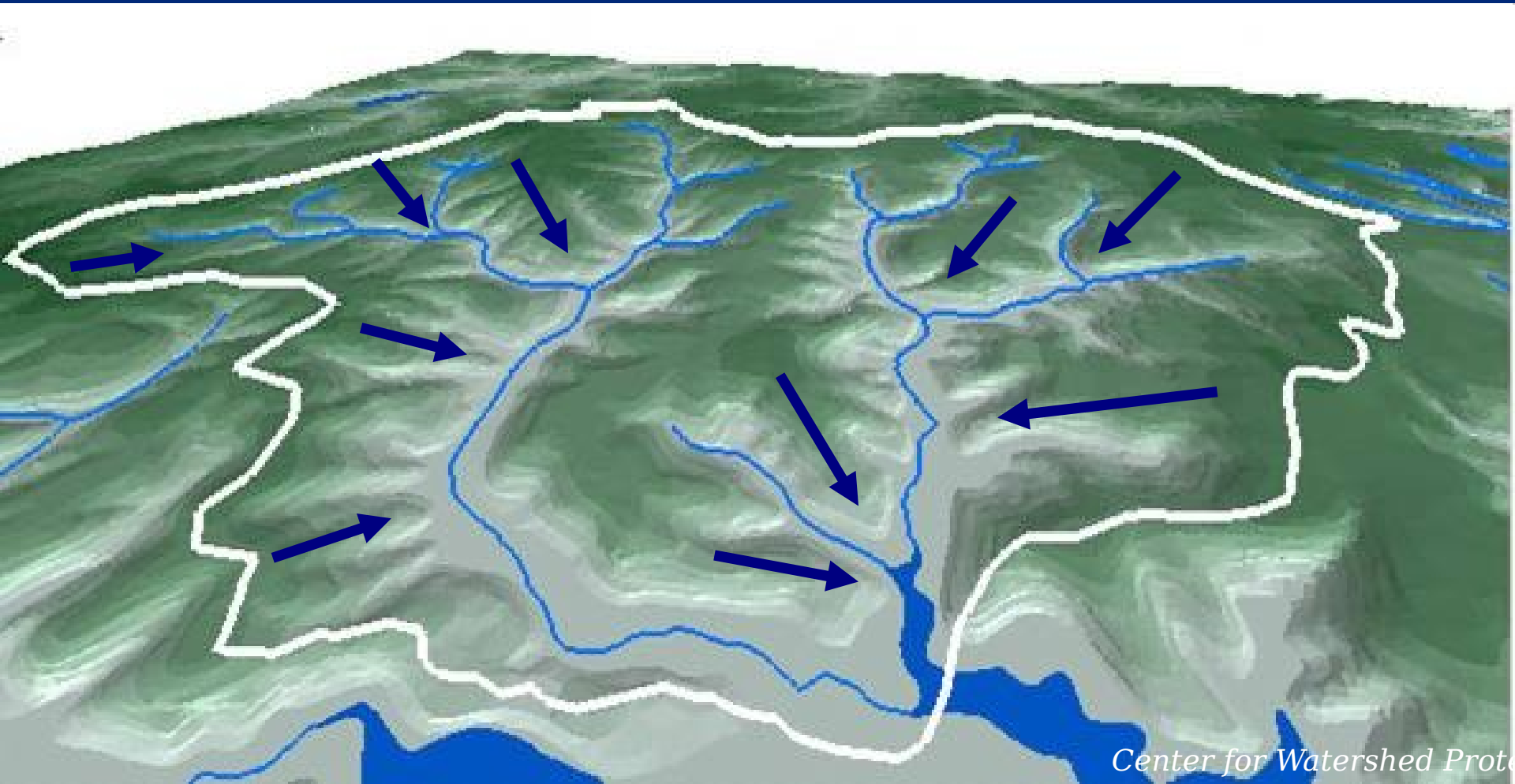
- Army Corps of Engineers participates on BOB
- Provide advice on wetland & riparian corridor creation on the Harpeth & Mill Creek sites
- Provide technical assistance w/data & analysis
- Provide mapping & watershed delineations

Tennessee Valley Authority

- Implementing & monitoring BMPs on industrial sites to evaluate their impact on water quality
- Use the BMPs as criteria for TVA Economic Development grants
- State Economic Development agencies will agree to the criteria, in cooperation with TVA

What are watersheds?

What happens to the land **effects** the water.



Is this familiar?

More Frequent Flooding

Higher Flood Levels

Landowner calls ?
Property losses ?
Threatened bridges and roads ?
Photo Copyright 1999, Center for Watershed Protection

Threatened sewer lines and infrastructures?
Photo Copyright 1999, Center for Watershed Protection

Familiar headlines?

Pesticides Found

Μαναγινγ μιχροβεσ φρομ υρβαν ωατερσ

Μαναγινγ μιχροβεσ φρομ υρβαν ωατερσηεδσ χ
αν βε α δαυντινγ τασκ, ασ βαχτερια αρε υσυα

Farmland: A Vanishing

Ωηεν ιτ χομεσ το βαχτερια, μοστ ωατερσηεδ μαναγερσ ηαπε μορε θυεστιονσ τη
αν ανσωερσ. Χαν α βεαχη, σηελλφιση ορ δρινκ

Fish Populations Continue

Ιν α ρεχεντ συρωεψ ρελεασεδ βψ τηε Ενωιρονμενταλ Προτεχτιον Αγενχψ σχιεντιστσ φουνδ αν αλαρμινγ δεχρεασε ιν τηε νυμβερ οφ τρουτ. Ονε ο φ τηε λεαστ υνδερστοοδ χονσεθυενχεσ οφ υρβαν γροωτη ισ τηε γραδυαλ βυτ σεεμινγλψ ινεωιταβλε λοσσ οφ ηυμαν υσεσ οφ συρφαχε ωατερσ. Ε ωεν α σμαλλ αμουντ οφ ωατερσηεδ δεωελοπμεντ χαν λεαδ το αλμοστ χο ντινυουσ ωιολατιονσ οφ βαχτερια στανδαρδσ φορ δρινκινγ, σωιμμινγ, σηε λλφιση ηαρωεστινγ ορ ρεχρεατιον δυρινγ ωετ ωεατηερ, ανδ οφτεν δυρινγ

Ιν α ρεχεντ συρωεψ ρελεασεδ βψ τηε Ενωιρονμενταλ Προτεχτιον Αγενχψ σχιεντιστσ φουνδ αν αλαρμινγ δεχρεασε ιν τηε νυμβερ οφ τρουτ. Ονε οφ τηε λεαστ υνδερστοοδ χονσεθυενχεσ οφ υρβαν γροωτη ισ τηε γραδυαλ β υτ σεεμινγλψ ινεωιταβλε λοσσ οφ ηυμαν υσεσ οφ συρφαχε ωατερσ. Εωε ν α σμαλλ αμουντ οφ ωατερσηεδ δεωελοπμεντ χαν λεαδ το αλμοστ χοντι νυουσ ωιολατιονσ οφ βαχτερια στανδαρδσ φορ δρινκινγ, σωιμμινγ, σηελλ φιση ηαρωεστινγ ορ ρεχρεατιον δυρινγ ωετ ωεατηερ, ανδ οφτεν δυρινγ δ

Shellfish Harvesting

δινγ τηατ τη
ρεσπονσε το
σο δισχωερι
λοχαλ ωατερ

Beaches Close Again After

Ιν α ρεχεντ συρωεψ ρελεασεδ βψ τηε Ενωιρονμενταλ Προ
αρμινγ δεχρεασε ιν τηε νυμβερ οφ τρουτ. Ονε οφ τηε λε

Driver Swept Away by Flash Flood

μσ, χομε φρομ μανψ οιφφερεντ σουρχεσ, ανο φο
λλοω μανψ χομπλεξ πατηωαψσ το ρεαχη ρεχειτ
ινγ ωατερσ.

Τηε ρεωιεω χονχλυδεσ τηατ χυρρεντ στο ρμ ωατερ πραχτιχεσ, στρεαμ βυφφερσ ανδ σουρ χε χοντρολσ ηαωε α μοδεστ ποτεντιαλ το ρεδυχ ε φεχαλ χολιφορμ λεωελσ, βυτ χαννοτ ρεδυχε τ ηεμ φαρ ενουγη το μεετ ωατερ θυαλιτψ στανδα ρδσ ιν μοστ υρβαν σεττινγσ. Ιτ ισ αλσο αργυε δ τηατ χυρρεντ ωατερσηεδ πραχτιχεσ ηαωε εωε ν λεσσ χαπαβιλιτψ το ρεμοωε προσ ιν στορμ ω

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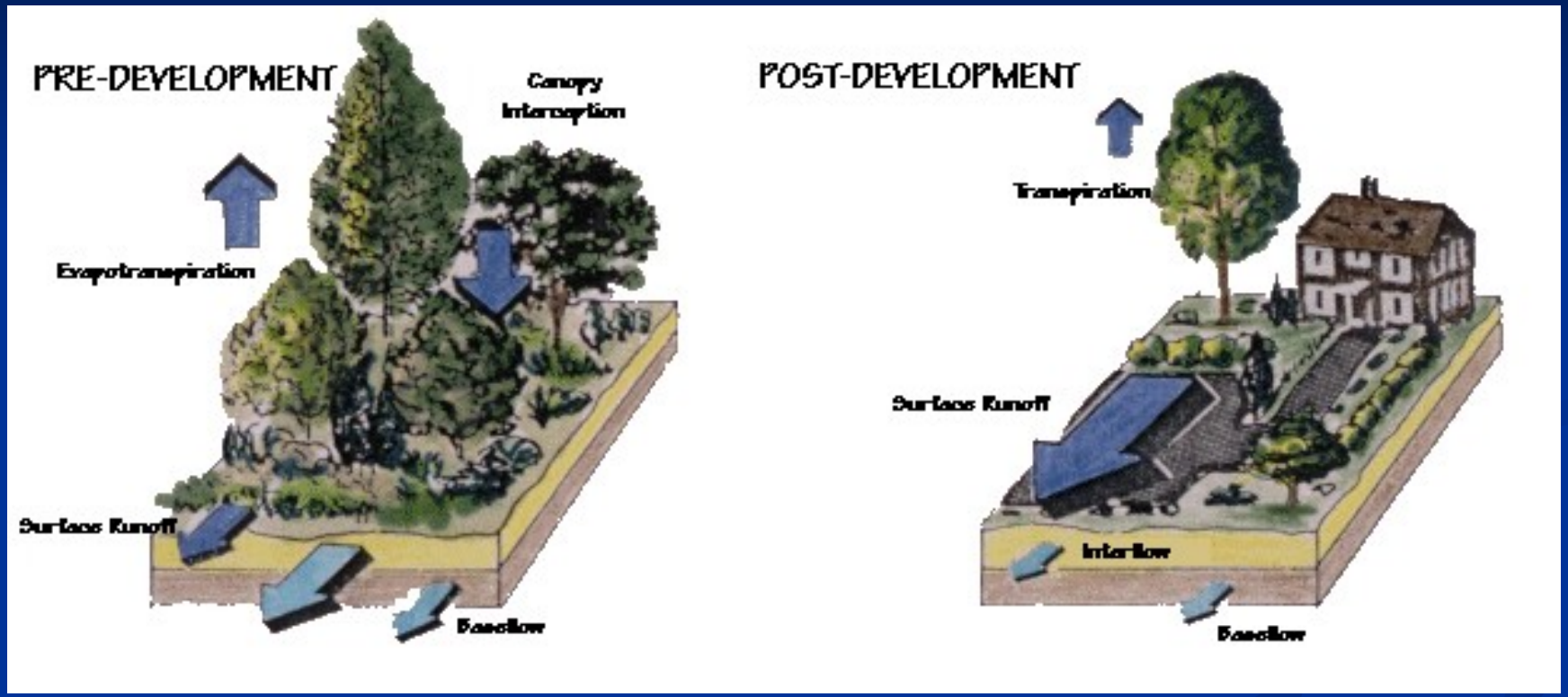
ανψ οιφφερεντ σουρχεσ, ανο φολλοω μανψ χομπλ
εξ πατηωαψσ το ρεαχη ρεχειτινγ ωατερσ.

Τηε ρεωιεω χονχλυδεσ τηατ χυρρεντ στορμ ωατε ρ πραχτιχεσ, στρεαμ βυφφερσ ανδ σουρχε χοντρο λσ ηαωε α μοδεστ ποτεντιαλ το ρεδυχε φεχαλ χο λιφορμ λεωελσ, βυτ χαννοτ ρεδυχε τηεμ φαρ ενο υγη το μεετ ωατερ θυαλιτψ στανδαρδσ ιν μοστ υ ρβαν σεττινγσ. Ιτ ισ αλσο αργυεδ τηατ χυρρεντ ωατερσηεδ πραχτιχεσ ηαωε εωεν λεσσ χαπαβιλιτ ψ το ρεμοωε προσ ιν στορμ ωατερ. Χομμυνιτιεσ

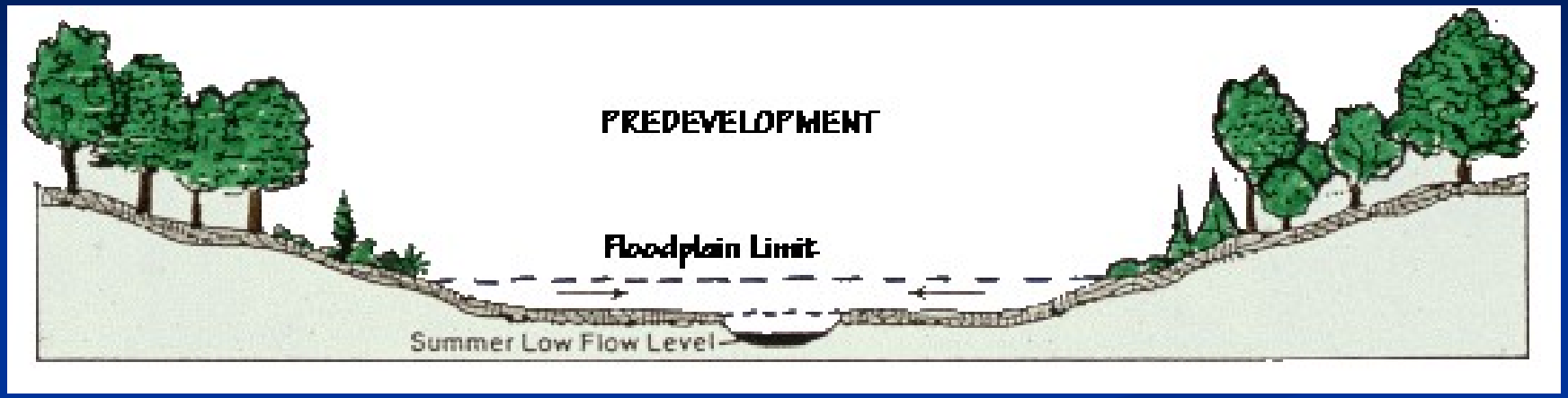
Water Bills to Rise 20%

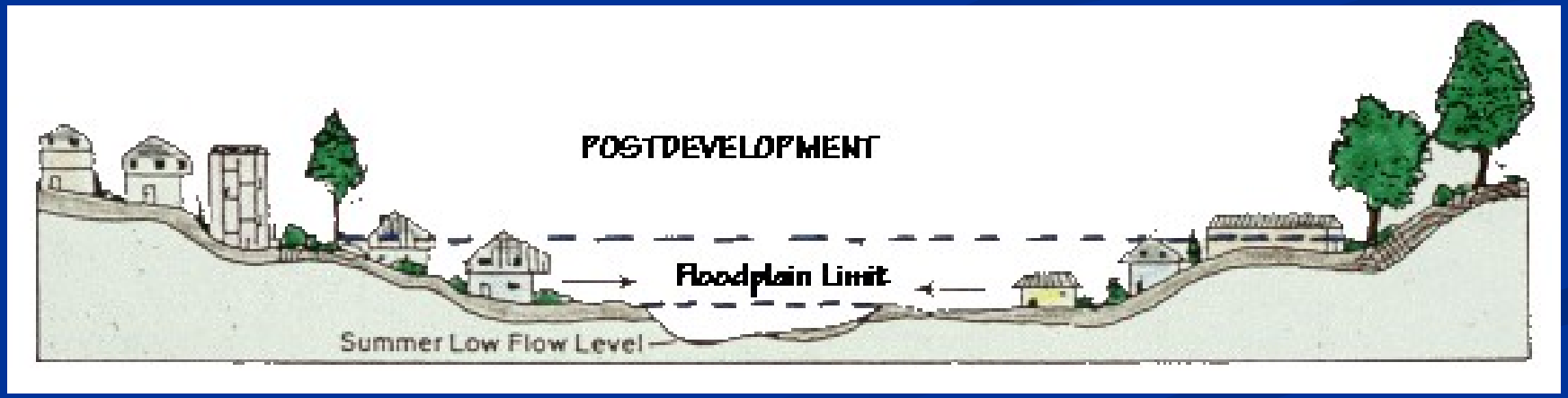
Φορ ωηατεωερ ρεασον, βαχτερια χοντινυεσ το βε η

Watershed changes



Watershed changes





Hardening of the arteries...

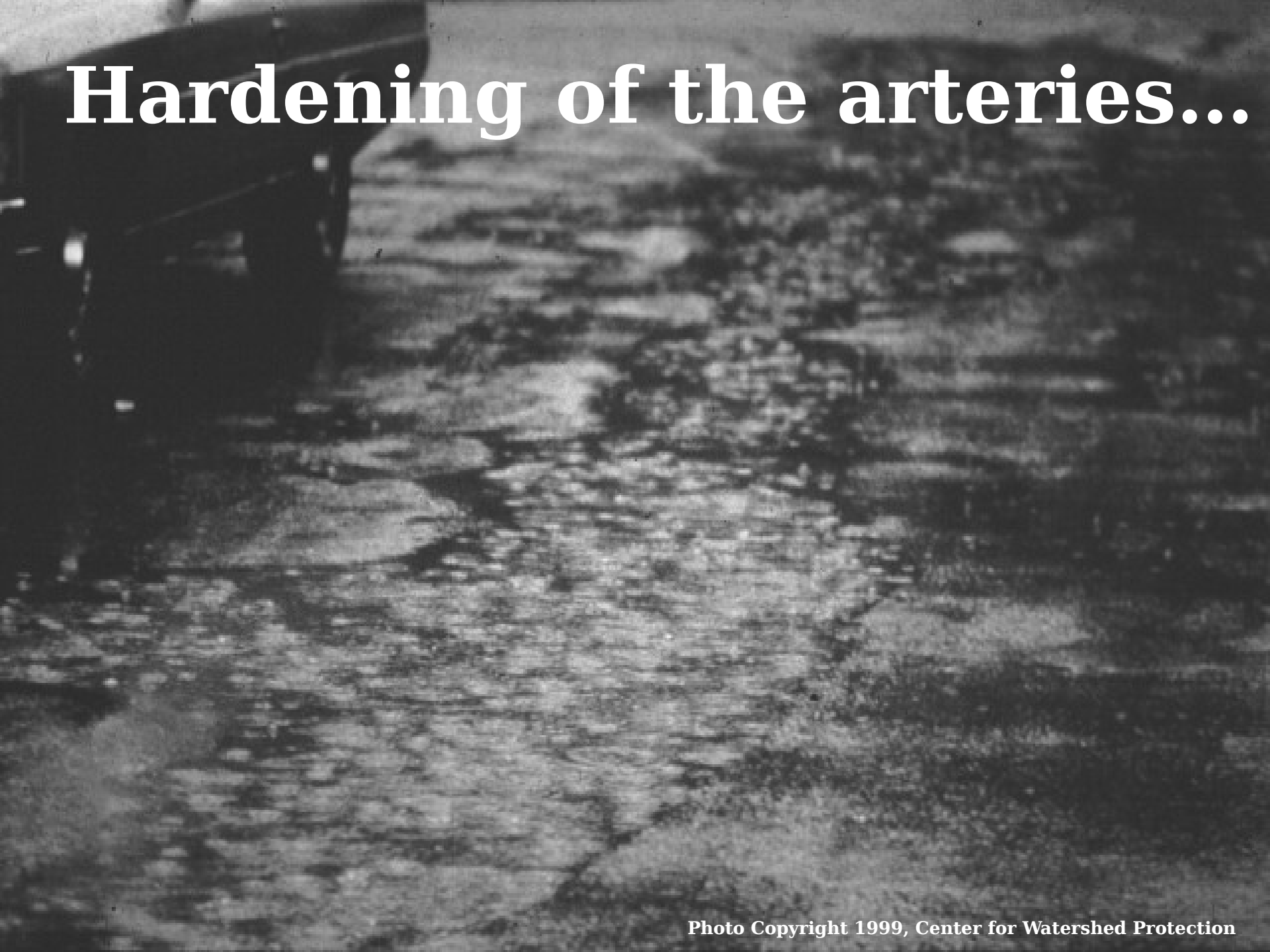


Photo Copyright 1999, Center for Watershed Protection

What is impervious cover?

- Any hard surface that prevents infiltration of rainfall
- Native vegetation in a given area
- Artificial landscaping materials like gravel & wood chips

Forms of impervious cover

When are streams affected?

Percent imperviousness?

- **10%**
- **20%**
- **35%**

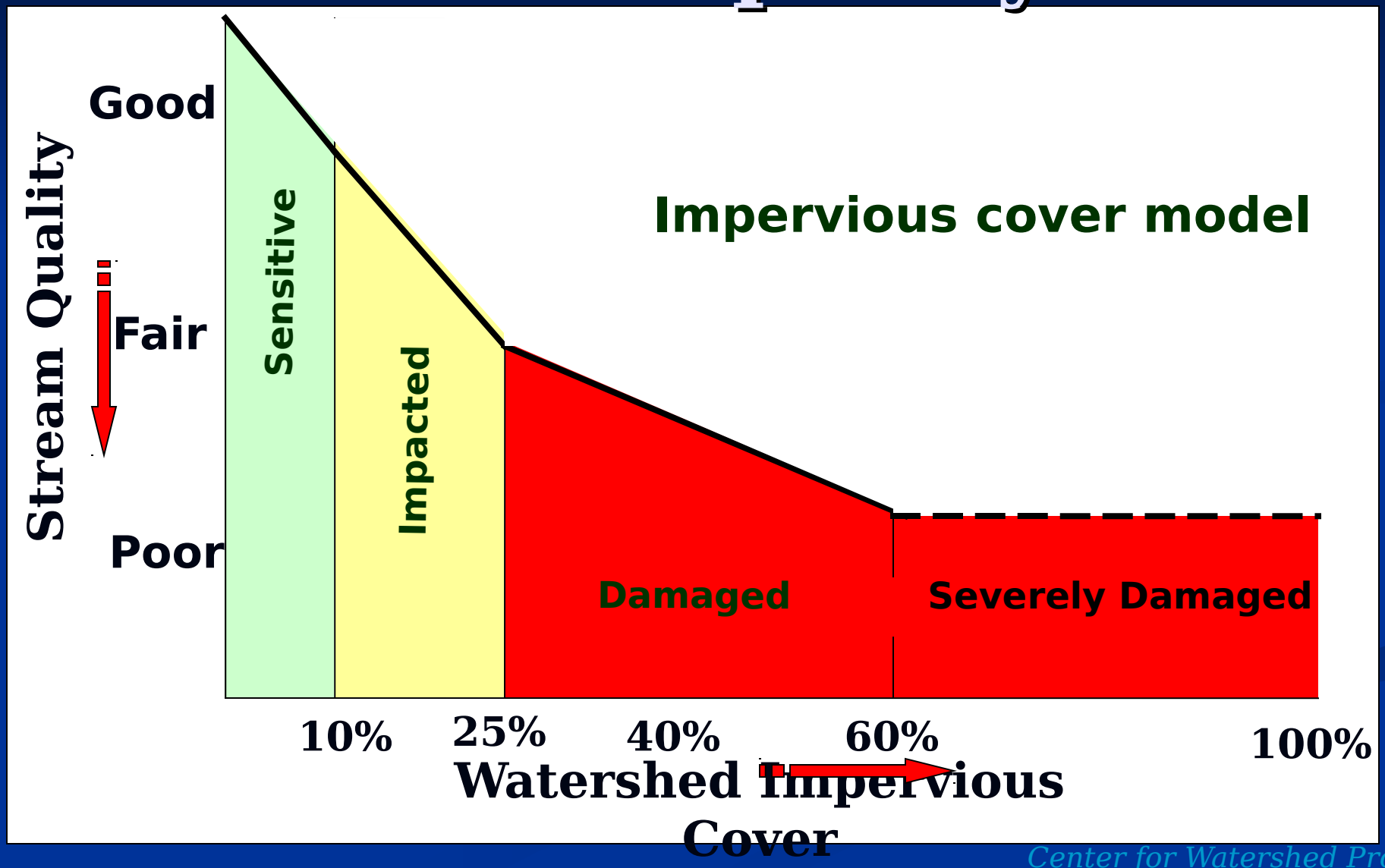
"More than thirty scientific studies have documented that stream, lake, and wetland quality declines sharply when impervious cover in watersheds exceeds **10 percent**."

Center for Watershed Protection

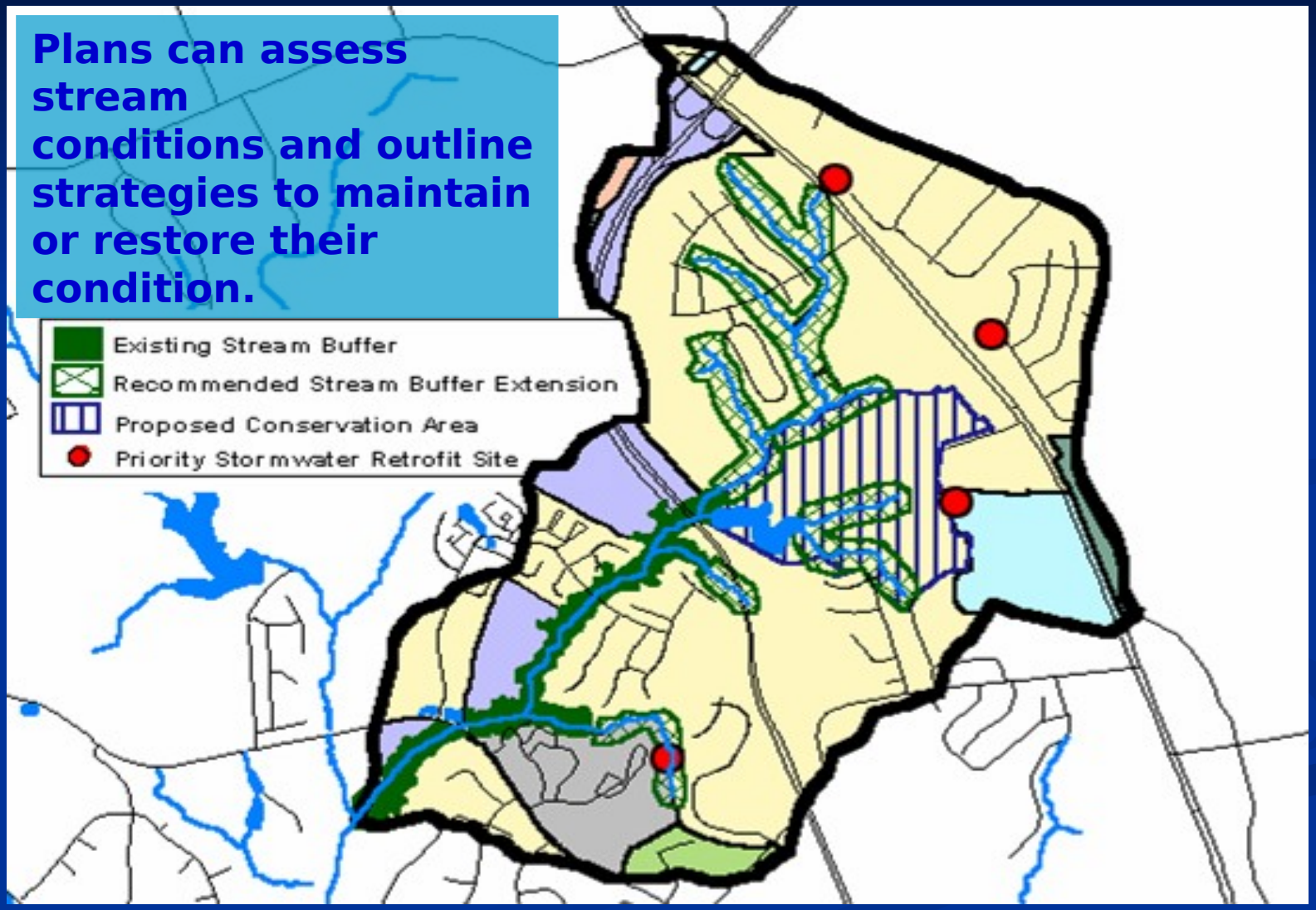
Impervious cover & stream quality

Impervious Cover

Impervious cover & stream quality



Watershed planning


Plans can assess stream conditions and outline strategies to maintain or restore their condition.
Existing Stream Buffer
Recommended Stream Buffer Extension
Proposed Conservation Area
Priority Stormwater Retrofit Site

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Watershed-Friendly

- **Better Site Design:** practices for individual & whole development sites
  - pervious paving
  - alternative subdivisio
  - stormwater basins
  - “green” infrastructure

Good

Cluster subdivision

Conventional subdivision

Not so good.

Center for Watershed Prote

Governors Preserve, GA

- Conservation community
- 860 acres
- 500 acres greenbelt
- 3.5 miles river
- National Wildlife Federation Certification

Greener parking lots

Good.

Not so good.

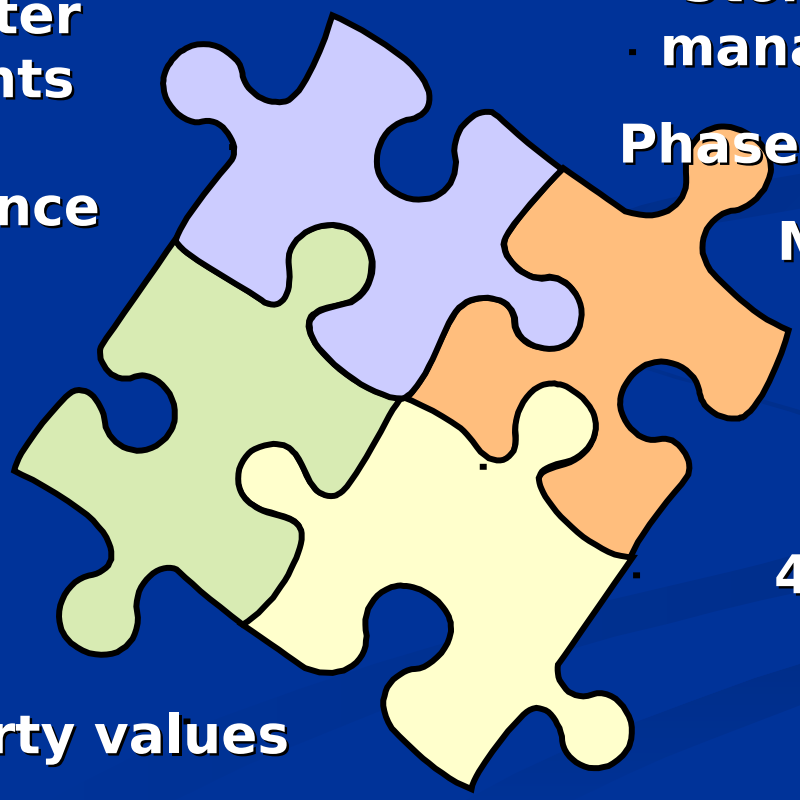
Vicki Bohnhoff, 1999
http://www.invisiblestructures.com

Center for Watershed Prote

Street Designs: Back to the Future?

- No curbing
- Open, grass channel
- Narrow street widths

Watershed Planning: Many Drivers



Benefits of Planning
Good business $ $ $

Property values

Cost to government

Cost to developers

Quality of life

Cost comparison

Development Costs	**Conventional**	**Better Site Design**
Engineering	$79,600	$39,800
Sewage & water	$25,200	$13,200
Road construction	$1,012,500 (20,250 linear ft)	$487,500 (9,750 linear ft)

Land use (490 acres total area)		
Developed	287 acres (59%)	69 acres (14%)
Undeveloped	203 acres (41%)	421 acres (86%)

Center for Watershed Protection, Remlik Hall Farm

BREAK

Summary: Urbanization on Water

- **Increased**
  - disruption of water balance
  - storm water runoff
  - bank full flows
  - flood peaks
  - frequency of (flash) flooding
- **Decreased**
  - dry weather flows
  - water quality, aquatic habitat, aquatic life

Summary: Impacts on Us

- ↑ Government costs
- ↑ Utility costs
- ↓ Quality of life
- ↓ Natural resource base

Model Principles For Development

1996 National Site Planning Roundtable for Development

- Diverse group of stakeholders
- Involved in planning, designing, building
- Developed a set of ***minimum*** BMPs to guide better designs

Roundtable Objective

To enhance economic growth through more watershed-friendly land use practices

National Roundtable Participants

- American Assoc. of State Highway Transportation Officials
- American Forest Association
- American Institute of Architects
- American Planning Association
- American Public Works Association
- American Rivers
- American Society of Civil Engineers
- American Society of Landscape Architects
- Chesapeake Bay Program
- Community Associations Institute
- The Conservation Fund
- Office of Comprehensive Planning, Fairfax, VA

Roundtable Participants

- Howard Research & Development Corporation (affiliate Rouse Co.)
- Institute of Transportation Engineers
- International City/County Management Association
- Land Trust Alliance
- Linowes & Blocher
- Loiederman Associates, Inc.
- Michael T. Rouse Company
- Montgomery (MD) County Council
- Natelli Communities
- National Association of Home Builders
- National Realty Committee

Roundtable Participants

- Natural Resources Defense Council
- Prince Georges County
- U. S. EPA Office of Sustainable Ecosystems & Communities
- U. S. Fire Administration
- Urban Land Institute
- Urban Wildlife Resources

3 Focus Areas

- Residential Streets & Parking Lots

  (habitat for cars)
- Lot Development

  (habitat for people)
- Conservation of Natural Areas

  (habitat for nature)

22 Guiding Principles

- Habitat for Cars
  - street widths, alternative layouts, cul-de-sacs, drainage, parking lots
- Habitat for People
  - lot size, setbacks, sidewalks, driveway surfaces, roof runoff, open space
- Habitat for Nature
  - buffers, conserving trees, incentives for conservation

Summary of Principles

Habitat for Cars:

1. street width
2. street length
3. right of way width
4. cul-de-sacs
5. open channels
6. parking ratios
7. parking codes
8. parking lot design
9. parking structures
10. parking lot runoff

Habitat for People:

1. open space devl
2. setbacks & frontages
3. sidewalks
4. driveways
5. open space mgt
6. rooftop runoff

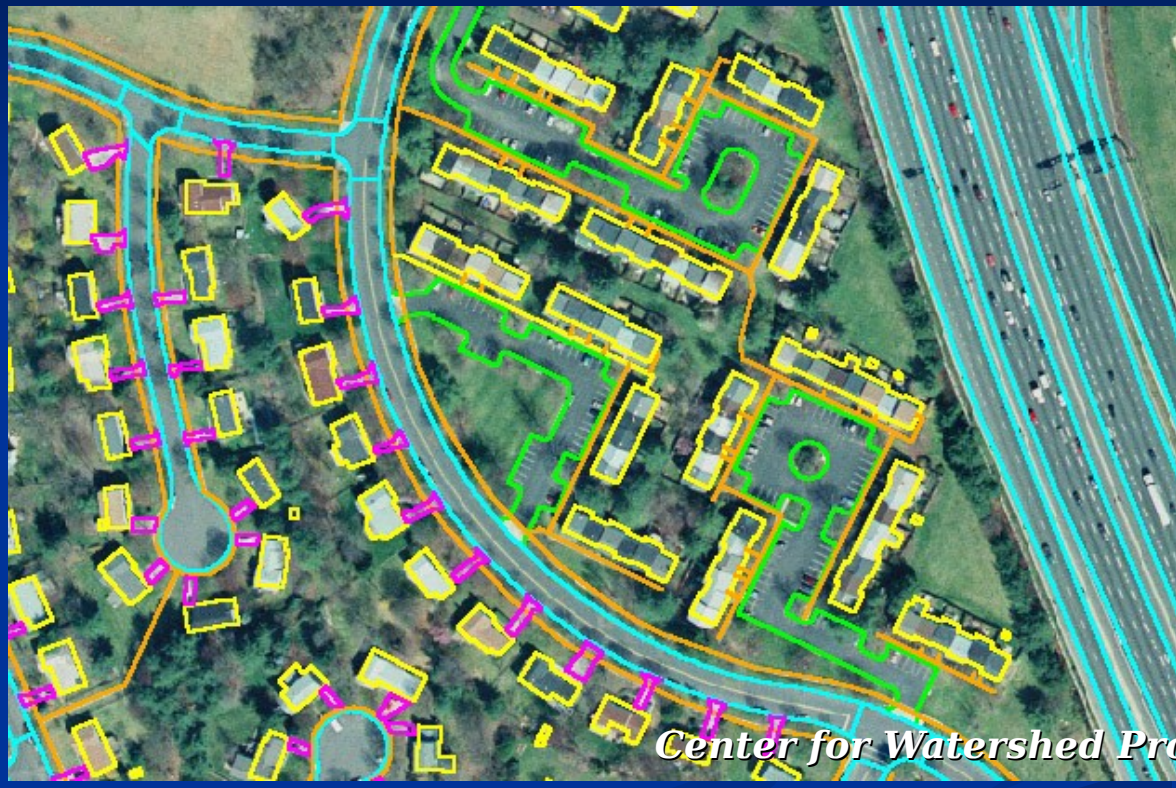
Habitat for Nature:

1. aquatic buffers
2. buffer maintenance
3. clearing & grading
4. tree conservation
5. conservation incentives

Habitat for Cars

Reduce impervious footprint:

10 principles



Habitat for People

Enhance quality of life, increase property values:

6 principles

Habitat for Nature

Protect natural buffers, habitat areas:

6 principles

Codes and Ordinance Worksheet

(COW)

Comparing your rules to model principles

Codes and ordinance worksheet

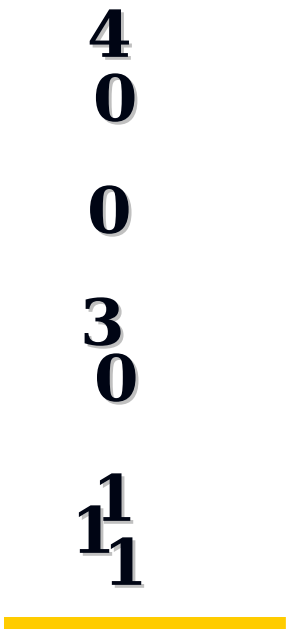
- Developed by Center for Watershed Protection
- Compares existing rules to model principles
- Benchmark for water quality friendliness of rules
- Used during Roundtable process
- Identifies issues needing improvement

Measures water quality friendliness

Score	Protection for water resources
90 – 100	Leader: keep up the good work
80 – 89	Good: minor changes needed
70 – 79	Opportunity: some improvement
60 – 69	Significant opportunities: much improvement
< 60	Serious: reform needed

Codes and ordinance worksheet

Example COW



10 points
out of possible 17

Time for a COW

COW Breakout

&

Discussion

NOTES

Small group reports; appealing ideas:

AFTER THE BREAK

Planning Roundtables

- Consensus building process
- Multiple interests convened
- Review and plan for economically viable and environmentally sensitive development
- Identify rules impeding better site design
- Recommend changes to codes, ordinances, zoning

Community Roundtables

- Evaluates current codes or ordinances

  impeding better designs
- Recommends updates or reforms
- Used throughout US, SE, TN

Examples of Planning Roundtables

- Harford County, Maryland
- Tennessee Growth Readiness Program
  - Blount County, Knox County
  - Memphis (inter-jurisdictional)

Tennessee Communities

- Blount County
  - Phase II & broader community issues
  - Modification w/in existing frameworks and codes
- Knox County
  - Phase II driven
  - Broad-based consensus process
  - Several areas identified for updating
- Memphis
  - Stormwater-driven & inter-jurisdictional issues
  - Uneven codes & ordinances between city & surrounding 4 counties

“Triggers”

- Growth rate is significant
- Community infrastructure costs increasing
- Pressing regulatory issues
- Open lands (still) remain
- Codes in need of updating
- Comprehensive planning coming

Quick Check

- Jurisdiction open to change
- Local agency takes to lead
- Project funded
- Goals and objectives of Roundtable established

Look for opportunity

- Connect people, science, and business
- Use local pictures
- Use non-threatening terminology
- Bring “outsider” “in” if neutrality needed

Who Should Be Involved?

Planning Agency or Commission
Road/Highway Department
Land Trusts
Real Estate Lenders
Fire Marshall
Land Use Lawyers
Homeowner Associations
Elected Officials
Site Plan Reviewer
Stormwater Management Authority
Dept. of Public Works
Developers
Realtors
Civic Associations
Health Department
Engineering Consultants
Chamber of Commerce
Urban Forester
Municipal Insurance
Watershed Advocates

Practical Startup Examples

- Letters of sponsorship
- Letters of invitation
- First meeting
- Follow-through

Resources & Support References

Southeast Watershed Forum

Community Growth Readiness Workshop

Pensacola, Florida

February 20, 2004

Southeast Watershed Forum

Changing Land Use Practices in Your Community

Callaway Gardens, Georgia

February 26, 2004

Workshop Topics

- Impacts on Watersheds
- Benefits & Tools
- Model Principles
- Consensus Building & Community Roundtables
- Starting a Dialogue